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A RECORD & REVIEW *of* CURRENT THOUGHT AND ACTION

VOLUME TWENTY-TWO | *March, 1903* | NUMBER THREE

THE TOLEDO SETTLEMENT IN HONDURAS

By JOHN L. COWAN

A GROUP OF TOLEDO SETTLERS AT THE ENTRANCE TO CATTLE LANDING CAVE.

THE most interesting spot in Central America is Toledo Settlement, in the southern part of British Honduras. It is a bit of Louisiana in a tropic setting—not Louisiana of today, but the old Creole state "befo' de wah," with its stately, ceremonious manners, its patriarchal relations between master and servant, its unbounded hospitality, and its rigid adherence to the code of honor. It is the home of a band of self-made exiles, of men without a country, living in the past and still loyal to the Lost Cause, which they supported with so much zeal.

The close of the civil war found many of the planters of the seceding states in sore straits. Their slaves had been set free, their crops destroyed, their live stock killed or driven off, their homes burned or defaced, and their plantations overrun by contending armies. Reduced from affluence to poverty, excited by the excesses of the carpet baggers, and affrighted by the spectre of negro domination, many of them felt that the south was no longer a fit or a safe place of residence for true born gentlemen.

The proudest and most exclusive element of our native aristocracy has always been the old Creole stock of Louisiana. Tracing their descent and the title to their estates back to the early days of Spanish or French occupation, it has always been their boast that they have kept their blood pure and free from Anglo-Saxon contamination through all changes of government and all the mischances of centuries. To this Creole aristocracy most of the irreconcilables of Louisiana belonged; and while their companions in misfortune accepted the verdict of the war and took up the battle of life again in their old homes, many of these gathered together such of their portable property as had escaped destruction, sold their estates for whatever they would bring, and emigrated.

A few went to Canada, many to Cuba, Porto Rico, and others to the West Indies; and fourteen families went to British Honduras. Of these fourteen families, the most prominent were the Oetzels, Biens, Perrotts, Waterous Wilsons, Pearces, Paines and Hutchinsons. All were from the neighborhood of New Orleans, and each family took along a number of former slaves, who preferred to follow the fortunes of their old masters rather than hazard the untried experiment of trying to earn an independent livelihood.

The immigrants arrived in Belize in the latter part of 1865, and were warmly welcomed by the colonial authorities, who realized that the one thing needful to bring prosperity to the country was the influx of an industrious population to develop its agricultural resources. It was hoped that liberal treatment of this band of malcontents might influence others to follow in their footsteps; and an act was promptly passed by the colonial council and ratified by the governor-general giving to the exiles 600 acres of wild land near the Rio Hondo.

It gives us an interesting insight into British colonial policy to learn that this grant was outside the limits of the territory claimed by Great Britain at that time. The boundary claimed by England after the naval victory of 1795 was the Rio Sibun, 90 miles north of the grant made to the Americans, and the permanent settlement made by these was the principal pretext for the extension of British claims to take in all territory north of the Rio Grande and the Amatique Inlet, 100 miles south of the original limit. To this land grab, unjustifiable and illegal though it unquestionably was, the feeble government of Guatemala was compelled to submit.

Here in the heart of the tropic wilderness the self-made exiles set to work to rebuild their shattered fortunes. Side by side with their former chattels, the tenderly nurtured aristocrats toiled in the burning sun, cutting down the primeval forest, building temporary dwellings, and planting crops to provide for their future wants. The surrounding country was inhabited only by roving bands of Indians, related to the Mayas of Yucatan. Fortunately

A TYPICAL TOLEDO HOME.

these showed no disposition to resent the intrusion into their domains, and have never made any hostile demonstration excepting during the general uprising of the Mayas in 1872, when the settlers were compelled to defend themselves by force of arms and to call on the troops stationed at Belize for assistance. Their nearest neighbors are the Caribs of Punta Gorda, 12 miles dis-

A PICNIC PARTY IN THE WOODS.

tant on the Rio Grande. To this point the government constructed a stone ballasted wagon road over which goods for the settlers and the productions from their plantations are hauled. Communication between Belize and Punta Gorda is maintained by means of numerous small boats manned by the Caribs. Could the trip from the settlement to Belize be made overland the distance would be comparatively short, but the country is so marshy and so intersected by lagoons and inlets that this is impossible, and a roundabout route of over 120 miles is necessary, by way of the government road to Punta Gorda, down the Rio Grande to the Caribbean, and up the coast to Belize.

The settlement was named Toledo. As most of the immigrants were sugar planters in Louisiana, it is natural that sugar growing is their main reliance in the tropics. About 6,000 barrels of muscovado, or raw sugar, are shipped to Belize annually, besides a considerable quantity of aguardiente, or rum. Cocoa, vanilla, tobacco, cassava, ginger, black pepper, allspice and turmeric are grown for export. From raising bananas, oranges, pineapples, beans or maize, excepting for their own use, the Americans are debarred by difficulties of transportation.

Surrounded by trackless and impassable forests, and separated from any other civilized community by many miles, the social life of Toledo Settlement is dwarfed and unnatural. House parties, picnics in the woods, and hunting and fishing expeditions are almost the sole diversions of the young people. Cattle Landing Cave, near the Rio Grande, a short distance above Punta Gorda, is a favorite rendezvous for hunting, fishing and picnic parties. It is of vast but undetermined extent, and the ambition of the adventurous is to explore it to its limits. The negroes affiliate freely with the Caribs and frequently intermarry with them; but the stiff-necked Creoles reject all social overtures from the English residents of Belize, and contract no marriages outside the settlement. Disclaiming American citizenship, they yet refuse to be considered subjects of Great Britain, and the only flag to which they pay honor is the stars and bars of the Confederacy. They are still unreconstructed rebels, and cannot be made to believe that north and south are now more firmly united by ties of both sympathy and interest than they ever were in the past. They still believe that slavery is a divine institution, and that the south but awaits a leader and an opportunity to begin another war for independence. Prints of Jefferson Davis and Robert E. Lee adorn their walls beside those of George Washington and Patrick Henry. The Settlement is in fact an anachronism,—a remnant of the old south transplanted by accident and preserved as a curiosity.

The original grant of 600 acres of land has been extended by subsequent purchases until the exiles now own more than 3,000 acres. It is but paying a deserved tribute to their industry to say that this is the garden spot of all tropical America. Material prosperity has attended them almost from the hour of their landing; want and poverty are unknown, and it is their boast that not a lawsuit or a serious dispute has occurred among them since the inception of the colony nearly thirty-eight years ago.

However, if this torpid existence seems restful to those who have survived the storm and stress of civil war and the arduous toil of taming the wilderness and rearing new homes, it is intolerably monotonous and oppressive to the young, vigorous and enterprising. Accordingly many of the most promising young men are departing for Guatemala, Honduras, Nicaragua and Mexico, preferring a more active career, even at the cost of a harder struggle for existence. So serious has this exodus become that the settlement seems in danger of ultimate extinction unless the Chinese wall of exclusiveness and caste prejudice is broken down.

VERTICAL HANDWRITING

THE question which is agitating the minds of many educators is whether or not to adopt, or if adopted, to continue, the vertical style of handwriting. It is claimed that the present generation of graduates from the "Duntonian system" are the worst penmen ever in existence, that the slanting, copper-plate letters have developed in the stress of business pressure into a perfect caricature of the beautiful, original copy. But the advocates of the new style of handwriting do not have unlimited freedom to do as they wish. A writer in The Boston Transcript, says: "Baltimore, at present is boiling over an agitation against the vertical handwriting. A large number of the merchants and bankers of Baltimore are bitterly opposed to the vertical system, and a number of managers of Baltimore business colleges say they cannot find employment for graduates who write the vertical style. On the other hand, the superintendent of public schools at Baltimore, Thomas A. Edson, one of the most expert penmen in the country, ex-Assistant Secretary of the Treasury Vanderlip, and many other prominent citizens, college professors, manufacturers, printers, etc., declare that vertical penmanship, the natural hand, is by far the best system ever used.

"St. Louis went through a similar agony, and one result was a public competition as to speed. Seventeen children from the seventh and eighth grades of the public schools were brought into the convention of the National Commercial Teachers' Federation a year ago. After a few minutes' practice upon the sentence, Our acts our little angels are, they were given two one-minute trials. In the second test the average for the class was nearly 148 letters per minute, the fastest writing 175, and the slowest 107 in the minute. Among those who witnessed the test were about fifty professional slant writers, many of whom had repeatedly condemned vertical writing as necessarily slow. They were twice invited to take the test in competition with the children. It is significant that none accepted the invitation.

"This is all very interesting, but it does not meet the question as to the results of the system under the wear and tear of business and hurry. We have in mind some young fellows around twenty years of age who were in the public schools, brought up on vertical lines, so to speak, and are now applying the system in daily affairs. Apparently, to judge by those who were of the first crop, the result of the vertical early training on the handwriting of maturity is to give it a sort of locked-stitch effect. Under the degeneration which takes place in all penmanship under pressure it is anything but clear. Indeed it is rather more confusing than the old scrabbling writing of the Duntonian system, after school-days and examination papers are long passed. The slant of the old-school penmanship at least secured a parallelism of lines to guide the eye as to the division of the letters from one another. But the vertical practice, in speed, evidently sets up a rotary motion in the pen-fingers, and the rapidly written form of it tends to assume the effect of one long connected tangle of hoop-like, circular or semi-circular strokes or segments, than which no bad writing that ever happened to unfortunates in positions where many letters are to be deciphered could possibly have been worse. This rolling gait, as it might be called, was observed, however, long before the vertical system was ever heard of, as the result of rapid work in longhand reporting and in the writing out of telegraphic messages from the clickings of the sounder. The vertical system, in fact, is only just beginning to be tested in practical use in business by the rising generations as they come along out of school and college and into actual work—and we shall now begin to see what happens."

DACTYLOSCOPY

IDENTIFICATION OF CRIMINALS BY THE FORMATION OF THE FINGER TIPS AND THE METHOD OF PRESERVING A RECORD

By SIGMUND KODICEK, IN THE "ILLUSTRIRTE ZEITUNG"

MAKING A RECORD.

A LECTURE recently delivered before the Anthropological Society of Vienna by Police Commissioner Windt, the director of the detective bureau of that city, gave an interesting account of his investigation of the various methods of recognizing a person by the formation of his finger tips, the so-called science of dactyloscopy. It is a well-known fact that a Turk who does not know how to write, never uses the cross when he signs a document, as the illiterate of other nations do. Instead, he carries a sponge moistened with a colored fluid in a wooden or tin box. Whenever he wants to affix his signature, he touches the sponge with the index finger of his right hand and leaves the colored impression of his finger tip on the document. He will always be able to identify his own imprint, just as we can distinguish our signature from that of other people.

Mr. Windt referred to the ingenuity of criminals in inventing new tricks in order to prevent identification, or, at least, to make it difficult for the police to recognize them. So it becomes necessary for the authorities to be on the alert, and to find ways and means to frustrate the efforts of clever criminals. Dactyloscopy is one of the means to this end.

A glance at the inner surface of the human hand shows deep furrows that branch out like twigs. These furrows, upon which the science of palmistry is based have always been of interest to chiromantists and gypsies. A closer examination, however, shows numerous inconspicuous lines that intersect the furrows and cover the entire inner surface of the hand. Dactyloscopy deals with these papillary lines. They cover the inside of the upper finger-point and form peculiar patterns, which can be divided into four distinct classes, curved, looped and gyrating patterns. In the curve pattern each papillary line runs from one side of the imprint to the other. Not one of the lines turns back to its starting point. They resemble the Indian bow, or that used by children for shooting arrows. The loop pattern consists of a group of papillary lines formed like loops made with a piece of string, such as we use to hang articles on a nail, or like a number of hairpins of different sizes fitted into each other, the largest on the outside and the smallest one forming the center. The gyrating patterns are formed by a spiral papillary line or a group of concentrated circles or ellipses. And the combined patterns consist of a loop and a scroll or of two loops. The unclassified patterns belong to this latter group. Every pattern formed by the papillary lines on the finger tips of the hand comes under one of these heads. This branch of dactyloscopy is called classification.

Purkyne, Herschel, Galton and other prominent scholars, who have made dactyloscopy the study of a lifetime, assert that these patterns always remain the same, and that they reappear in their original form even after they have been removed by cauterization or through some accident. The lines can be plainly discerned on the fingers of a corpse that has been in the water for a considerable length of time. The finger tips of mummies show the patterns formed by the capillary lines very plainly. The identification of human beings is thus made easy by the knowledge that the invariableness of the papillary lines is an established fact, and the simple way in which they have been classified gives further aid.

An imprint of the finger tip is necessary to make identification absolute, and the process employed to obtain it is as follows: A drop of printer's ink the size of a lentil is placed on a metal plate and rubbed over its surface with a roller, thereby covering the plate with a thin layer of color. Then the inner surface of the finger tip—from one end of the nail to the other—is rolled lightly over the plate. After this the blackened tip is passed over the measuring chart, which completes the process.

The large quantities of charts with these impressions that will accumulate in the course of time, would have as little value as any other pile of worthless paper if it were not for the ingenious system that is used to register them, thus facilitating the finding of any one particular card. The so-called Henry method of registration—based on the permutation of figures—which is at present being used by the London police department, is considered by competent judges to be the best system. The first step towards identifying a person is to get an impression of his finger on a card which is used for that purpose. Then this card is classified and given its appropriate place, according to arithmetical calculation. If a duplicate card is found in the corresponding place in the registry, dactyloscopy has identified the person in question beyond a doubt. This method of registering cards also makes it possible to identify persons whose duplicate card gives a reproduction of only a few finger imprints. Thus far only such impressions as are made for a purpose have been discussed. But Mr. Windt has succeeded in making dactyloscopy a most valuable agent in examining traces that are barely visible to the naked eye.

TYPES OF FINGER IMPRINTS

It often happens that bloody impressions of fingers are found at a place where a crime has been committed. Such traces, as well as other marks on freshly painted furniture, doors or windows, on dusty tables, piano covers, daubed or dust-covered window-panes are as plain as the impression on a seal. By applying the Windt process it is possible to prove that certain persons were present at the scene of some crime. Further experiments have proved that a clear pane of glass or a plain piece of white paper show a finger-print not discernible to the naked eye after having been touched. In such a case it is necessary to sprinkle the spot with a specially prepared powder, within a reasonable length of time after the finger has touched it. After this it is plainly visible and ready for dactyloscopic classification.

It is hardly necessary to enumerate the great advantages and possibilities vouchsafed to the police service by the proofs of the efficacy of dactyloscopy.

THE NEW IDEA IN INDUSTRY

SURVEY OF SOME OF THE WORLD'S MODEL INDUSTRIES

By WILLIAM H. TOLMAN

FROM the point of vantage of those who are able to observe the entire field of social activity and note those movements for real betterment, the balance must be placed to the credit of progress and advance. There is a forward social movement and there is no reason for discouragement. If one looks for gratitude in return for favors, or even justice, he is mistaken; yet that fact does not lessen individual responsibility. Noblesse oblige was never truer than today.

The business world is usually the first to organize and, for the promotion of the greatest efficiency, apply commercial common-sense. Accordingly, the clearing-house.

In the growing number and the varying adaptation of movements for improving the condition of the employed, there is also the need of a social clearing-house for the prevention of overlapping and duplication of social and industrial effort. Such a clearing-house already exists in the New York League for Social Service. In addition to this, there is also the necessity for the interpretation of the collected material, so that the individual employer may know what he can best adapt to his own individual and particular needs. At this point expert specialization is demanded, so that the employer may know just what he may do first to the best advantage and why, because he does not want to make any mistakes.

It appears that a personal touch, a human point of contact, has been lacking, and is highly desirable; that there was no means of bringing people together, so that they might see each other and hear what each had to contribute from his own experience.

Social engineering is one of the newest professions, and in the conscious need and the imperative necessity for accurate scientific information, which may be instantly applied, there will be an increasing demand for the services of the social engineer.

Certain arts have reached a high degree of organization. The art of war is now so highly specialized that most of the nations are afraid to disturb the equilibrium of outward peace; commerce is laying under contribution the most highly improved means of transportation and communication, whereby she is occupying the remotest corners of the globe; machinery is so delicate in its mechanism and so complicated in its operation that we are no longer amazed at the marvels of the inventor and the mechanician.

Improved machinery is creating a demand for improved men, and it is the business of the social engineer to make improved men to operate the improved machinery. In the making of an improved man the first element is a true home, or an opportunity for himself, his wife, and his children to enjoy pure air, light, and water, the physical essentials of a home. Given these conditions the chances all favor a desire on the part of the parents for the mental and moral development of the children, whereby they may have better opportunities than their parents for getting on in the world.

The modern factory is the industrial home, where the wage-earner spends at least one-third of each working day. The working home must be made bright and airy by means of many windows; the colors should be restful in tone, especially where the work is of such a character as to admit it; the hygienic installation of toilet closets and lavatories should be ample and modern—that is, the best, which is another way of saying the cheapest; order and discipline should be kept to a high standard, because based on justice and sympathy. This in general is what the social engineer must accomplish.

All these provisions mean the elimination of charity, for the self-respecting employe does not want it, nor will the self-respecting employer offer it. If an employer introduces any form of industrial betterment as charity the workers will say, "Why not increase our wages to that extent, and we will take care of our own charity." And they are right. What the employe does want is an opportunity to increase his wage-earning capacity, for increased capacity is almost always sure to mean increased responsibility, hence higher pay.

A prominent business man, president of a coal and iron company at Birmingham, Ala., Mr. Gilraeth, writes:

"It has occurred to me to state also that I have an idea that good wages will not always and at all times satisfy men. My judgment is that love is the only thing that will control them at all times and under all circumstances; and unless a man can love his operatives, and have them love him, he cannot control them under all the trying ordeals through which both sides will have to go during the life of a business. In my judgment, there comes a time in the affairs of our operatives in which they will not be satisfied with money alone. In other words, I think occasionally a crisis arises in their affairs, or they get in such a shape or frame of mind that nothing will satisfy them but to feel that they are loved by their employer.

"If an operator can really love those who are under his control, and not look on them as servants, but as friends, and can make them feel that his liberality is not exercised as a gift to be especially grateful for, but that it is his pleasure to divide the earnings with them in an equitable manner, and can assure them of his love and sympathy—then, and in that event he can control them when a serious crisis comes. But I do not think any operator can ever exercise a successful headship over his employes unless he himself first acknowledges the headship of God. In other words, he must know of himself that he is human after all, as well as his employes, and that God is maker and ruler of us all. A man of this kind will not overstep his authority and will generally find ways to comfort and control his men at times when they are seriously disturbed and in doubt."

European civilization, the product of many centuries, has been in advance of us in recognizing the need for industrial betterment institutions. Many of the promoters of these movements have been men of scholarly attainments, culture and refinement. They worked at these solutions because it was a pleasure. Then, too, there was the altruistic spirit, a genuine desire to make the world a better place to live in.

On the other hand, in our country only a generation ago civil strife paralyzed the industries of the nation. When peace was declared every man of affairs devoted his whole energy to the building up of his own affairs. Even then he had a hard time to get along. Most of our business men rose from the ranks and won success by their untiring energy and push. Many of them did not have even a common-school education. Our population is so cosmopolitan that any feeling of fraternity is slight. The assimilation of these foreigners is very slow. In our great commercial centers are thousands who not only do not speak our language, but do not think in terms of American ways and customs.

Today the situation is changed. Our nation is prosperous. We have great captains of industry who have amassed greater wealth than has ever been heard of in the old country. Capital and labor have become two mighty forces. What is now needed is a recognition of the identity of their interests, and the next step toward its realization is to make use of the experience of the older countries in their practical forms of industrial betterment, adapting them to local conditions. It is easier to form than to reform.

THE SCIENCE OF RIGHT LIVING

THE Rev. Dr. N. D. Hillis recently stated some bold facts in a public address. He said:

"Children are bundles of ungrown roots. How they shall develop depends on the training they receive. And this training must be in morals as well as intellectual pursuits. Of what value is it that colleges without number are founded if we have no university of morals? No republic was ever great that represented moral illiteracy. We send our children to Sunday School, where incompetent teachers for fifteen minutes try to inculcate moral lessons.

"The father of a family is willing to be a tailor for his boys, the mother is willing to be a cook, but when it comes to giving any moral or religious education to the children, both withdraw and leave it to anyone who will attempt it. This law carried out for one generation brings us to the pitiful condition of moral illiteracy in which we find ourselves.

"No youth can hope to attain weight of character who does not practice early the culture of Christian faculties as he does his art, his law, his science. And as his efforts in one are directed so should they be in the other. The highest form of scholarship is the science of right living."

THE TRUE ORIGIN OF COAL

THEORY OF HOW COAL IS FORMED FROM PETROLEUM INSTEAD OF VEGETABLE FIBRE

By WILLIAM C. WELLES

ALL geologists unite in claiming that the vegetation of the coal period, resembled the Mangrove Forests of our southern coasts, alligators, reptiles and all. This assertion cannot be true, for mangrove vegetation flourishes in salt or brackish water.

Who ever saw or heard of a mangrove swamp on a mountain ridge, a great plateau or extensive plain?

There is not one particle of direct evidence which would be accepted by an unprejudiced judge in a court of law to prove that coal is of vegetable origin; it is all circumstantial.

Hugh Miller, after the declaration that coal is of vegetable origin and evidently feeling that such a broad statement ought to be followed with some evidence to corroborate it, says: "At least we find the roots of vegetation in the clay beneath the coal." He does not go on and tell you that those roots are never converted into coal, but are always slate or sandstone. He does not tell you that the trees which grew on those roots, whenever found, are also converted into solid rock—never into coal. He does not tell that these roots are found in rocks where there is no coal, and with their trunks attached, and never in one solitary instance have they been converted into coal.

I defy any geologist to bring forward a tree, or a fragment of one, or a section of vegetation, of any form or kind, which has been converted into genuine coal.

I have seen tree stems and tree stumps taken out from contact with coal, and they were all solid rock.

I have seen sigillaria (tree) stems compressed in coal to thin slabs, but they were always solid rock.

I have the testimony of geologists who have seen and examined thousands of them, and they have been compelled to admit that they have never seen one converted into coal.

I will give a quotation from another distinguished scientist, which is similar to that of Hugh Miller, but is much more sentimental. He writes, "The numerous remains of plants and stems of trees found in the coal tell us, in the plainest language, that this mineral fuel is the remains of vast forests and other large growth of innumerable plants, which have lived, died and have been entombed by the all merciful hand of Providence, thousands of years ago, and are now being exhumed for our benefit," etc.

In the above extract leave out the word "fuel" and substitute "rock" for "coal," and you have stronger proof that rocks are of vegetable origin than you have of the vegetable origin of coal.

It seems never to occur to these logical scientists that stems of trees in the coal, which retain their vegetable characteristics so as to be recognized as vegetable fibre, after having endured the same temperature, pressure and general conditions in company with coal for hundreds of thousands of years, and itself not converted into coal, is one of the strongest arguments against the vegetable origin of coal which can be produced, and this condition of vegetable matter in contact with coal is universal, and proves that coal is not from vegetable matter.

It is a pity to overthrow a theory so prolific of sublime flights in oratory as this vegetation, carbonic acid, sunshine theory of the origin of coal has been, as treated by the lecturers on scientific subjects at the present day.

I quote from Prof. Cook, in his New Chemistry. "The origin of all of this energy is the sun, and it is brought to the earth by the sun's rays."

"The energy which drives our locomotives and forces our steamships through the waves, came from the sun."

"The sun's rays are the Ithuriel wand, which exerts the mighty power," etc.

That coal was formed from a liquid rather than from vegetation is proven by the physical characteristics of coal.

First—We find it made up of a great number of parallel veins, the lines of the stratification clear and distinct and perfectly parallel, each with the other, and all parallel with the stratified rock above and below.

The only common sense conclusion is that this condition requires the coal to have been a liquid when originally deposited, for in no other way could it have spread over such extensive areas and retain its perfect parallelism.

A second conclusion is that these seams were built up by successive layers of this same liquid material. There can be no question about the correctness of this position.

The remarkable purity of the coal between the successive planes of stratification, not only proves its liquid condition originally, but also that it has been deposited in successive layers at irregular intervals.

One layer having hardened, the leaves and sticks deposited upon its surface form cleanage planes between it and the succeeding liquid layer above.

Any foreign material deposited on this new layer before it hardens passes through to the solid one below, but if sufficiently hardened it remains on the surface.

Occasionally we find a layer of thick, slaty material between these layers of coal, which proves its horizontal position near the level of the sea, so that the sea can occasionally break over it and deposit this slaty vein of sediment, a condition under which these fresh water coal plants would not grow. Pure coal breaks up into cubical crystalline forms proving conclusively that it was originally a liquid.

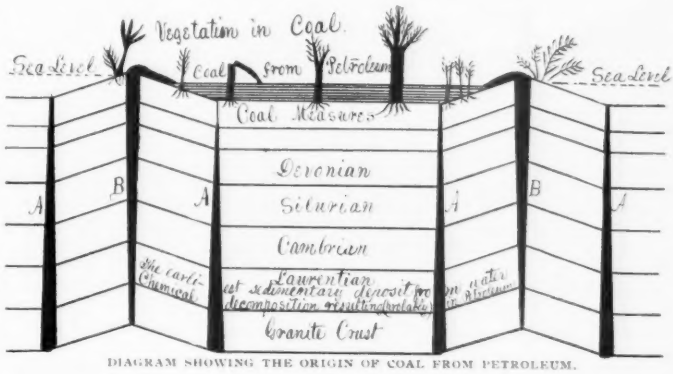

DIAGRAM SHOWING THE ORIGIN OF COAL FROM PETROLEUM.

Piedmont, W. Va., coal is so pure that it is difficult to obtain a lump larger than a black walnut.

We find, therefore, that the physical condition of coal is such as to demand that in its original form it is a liquid and therefore not vegetable matter.

Second—This original liquid must also possess the chemical constituents of coal.

Third—It must be capable of solidifying to any extent under heat and pressure or exposure.

Fourth—It must have been a material developed prior to that period of the world's history when the earth, by cooling and condensation, was just beginning to rise above the sea and long ages before the dry land was ready to produce its higher order of vegetation.

Such a material we have already prepared which fulfills all of the conditions required by the physical condition and structure of coal.

A theory based upon this material for the origin of coal requires no change in the climate of the coal period; does not insist upon peat growing under conditions in which it will not grow, nor does it compel us to locate continents, mountains, rivers and forests where, actually as well as logically, old ocean reigned supreme.

The Great Creator foresaw the necessities of His creatures and provided for their future comfort and happiness by storing away in the earth, in different forms, a material which is and has been an absolute necessity to the human race.

One part of it He stored away in the earth in the solid condition represented by the varied forms of coal, and the other He left in the earth in its original condition, that when other resources failed, we might find light for our guidance in the darkness of night.

If there is one thing that proves the Providential care and foresight of the Omnipotent Creator, it is shown in this storing up in the earth, against the wants of future ages, a material without which the wheels of progress for the last 40 years would have been blocked and the wonderful advancement of science and art

in this nineteenth century would have been well nigh an impossibility.

At the time of its discovery the earth was well nigh groping in the dark, the insignificant tallow dip scarcely made the darkness visible; the stearine candle gave a higher tone to the darkness rendered visible by its rays.

The trees of the forest yielded their turpentine and combined with the alcohol from the grain of the field paid tribute to the insatiable demand for light.

In addition, the demand for animal and vegetable oils for mechanical uses lubricating machinery, etc., was so great that prices remained almost prohibitory and threatened to go higher as the demand increased, when in August, 1859, the first petroleum well in Pennsylvania gave to the world a material which proved to be the very thing which the conditions of human life and improvement demanded.

Petroleum is that material, and from petroleum originated coal, and in this material we find all of the conditions surrounding the origin of coal fulfilled.

First—It is liquid, and herein we find the possibilities of those long continued, sharply defined, slender layers of uniform thickness of which hundreds are found in the majority of coal mines, of workable thickness, and which have been traced in one instance, unbroken, over an area of 1,000 square miles.

Herein we find a complete explanation of the phenomena presented by the parallelism of veins in the coal seams, and there is no call for the supposed invention of miraculous agencies to account for it.

Here, also, we find an explanation of the exceeding purity of the veins of coal which so puzzled Lyell and caused him to invent a filter to filter out the dirt.

Second—Its composition chemically coincides with that of coal in its various forms. Genuine coal has carbon, hydrogen and oxygen. Petroleum has carbon and hydrogen; as it solidifies the hydrogen passes off or decreases in quantity and at the same time oxidizes and in this way slowly approaches the composition of the various forms of bituminous coal.

Third—Petroleum solidifies to any extent more rapidly when the layers are thin, and this solidification is accelerated by heat.

No supposititious complication of circumstances is required to convert it into the various grades of coal as it is assumed in the vegetation theory and which after all is at variance with the logical conditions.

Fourth—It accounts, logically, for the coal and carbon found in the Metamorphic and Laurentian rocks, which originated long ages before any kind of vegetation ever grew and logically accounts for these carbon products whenever and wherever deposited.

Fifth—It existed in the earth long ages before the coal period, and was ready and prepared to take its place in the divine economy, naturally and logically, without any necessity of violating the logical order of creation, by locating forests and mountains in the world's watery wastes about a million years prior to the time when that beautiful and logical arrangement in the Creator's plans had elevated the continents above the level of the seas.

Sixth—Oil existed before coal. This is proved by the every-day experience in the oil fields of the world.

In West Virginia and Pennsylvania it is found in the lower coal measures, on down into the lower Devonian in Western New York and Canada, which is older than coal.

In Ohio, Indiana, Kentucky and Tennessee it is found in the Silurian limestone, and the earliest and exceedingly scanty remains of terrestrial vegetation are found in the upper or newer Silurian long ages before the coal.

At other points, notably in Cuba, South America, British America, etc., it is found in the metamorphic rocks where it probably originated, being without doubt an accidental product at all points where found above this position.

It is found as often and in tenfold greater abundance in the strata connected with the world's coal deposits than is vegetation, and is more than an offset to the claims of the geologists which have been based entirely on the proximity of vegetation to the coal.

With this overwhelming advantage in favor of petroleum, that numerous beds of soft coal, which could not by any possibility have originated otherwise than from petroleum are found; each one where the evidence is complete that it originated from petroleum and in no other possible way, while not one bed of genuine coal is found where there is any evidence of its vegetable origin.

Petroleum is an universal product and is found in almost every country worth naming upon the face of the globe. It is found in all strata above the original strata, even to the surface.

Petroleum evaporated by slow heat in a suitable apparatus produces a pure vitreous material, with a conchoidal fracture identical with pure coal, having all of its physical characteristics and chemical elements, and cannot be distinguished from the pure coal.

Tracing this material from the limpid, liquid conditions, it is found in every degree of viscidity, down to semisolidity and in all degrees of solidity to anthracite coal.

This theory requires no change in the earth's physical condition, but we simply substitute petroleum for decaying forests (which did not exist), flimsy ferns, swamp producing plants, and peat beds, which would not grow at all.

As these coal basins rose to a level with the sea, the bending of the strata caused a dislocation and fissures opened, as are seen in the diagram.

A passage (at first a slender one) having been thus opened from the surface downward to the strata, wherein the petroleum originates (all of these movements are very slow and deliberate) and the petroleum begins to flow as soon as the first slender fissure is opened, the oil runs out into the basins in which the coal is found and through the agency of the warm earth and air, begins to thicken up and oxidize.

After a reasonable interval (it may have been years, for it is calculated that it would require 100 years to form an inch of coal from vegetable growth) the slow contraction of the earth causes the fissures to open wider and an additional flow of petroleum results, forming a new layer.

While each layer is hardening, leaves and sticks from the outer raised edges are blown in by the winds, and take their places between the thin layers, where we now find them. Occasionally the waves of the sea or high tides may have swept over the outer barriers of the basin and left a thin layer of mud or slate in the coal.

Each additional flow caused by additional shrinkage of the earth adds a new layer to the coal bed, and in this way our coal seams are built up. (A coal basin five miles long and one mile wide would require over three million barrels of oil of 40 gallons each to fill it one inch in depth.)

Notice in the diagram the crevices B B, on the edge of the coal basin, pouring petroleum into the basin at the sea level. Now when this basin descends below the sea level, the waves carry the earth and vegetation from the margin of the basin and deposit it upon the surface of the embryo coal.

The fissures A A in the diagram represent synclinal fissures wide at the bottom and closed at the top, which allow the petroleum from its place of origin (below the Silurian) to rise and diffuse itself through the various "oil sandstones" where it is reached by the drill in the oil regions of the country. These fissures are greatly exaggerated for the purpose of showing more clearly the general principle.

At "Sour Lake," in the Beaumont, Texas, oil region, petroleum is slowly hardening into coal, having reached the lake basin through fissures in the rocks opening from the oil beds below.

You can now see how clearly, plainly and logically all of the difficulties which are found in the way of the vegetable origin of coal vanish in the light of this true theory.

The deposit of coal was not confined to one period only of the world's history, but from the metamorphic period all of the way along to the present time, we find deposits of coal in its different forms.

FIREPROOF ELECTRIC CARS

MR. CHARLES T. YERKES, who is giving an electric system of transportation to London, tells of the methods he will employ in making his four underground tube railways fireproof: "I believe that no underground railway should be run without fireproof cars. All of our rolling stock will be absolutely fireproof. The cars will be constructed of steel, pressed asbestos, and fireproofed wood, but as little wood as possible. The pressed asbestos will very closely resemble wood. It may be treated like wood, so that one may have asbestos oak, mahogany, ebony, or what not. The ties will be non-inflammable. I do not intend to have any holocausts on our roads. The tubes will all be of wrought iron."

WHY READ THE BIBLE IN PUBLIC SCHOOLS?

A REPLY TO THOSE WHO MAINTAIN WE SHOULD LIMIT THEM TO SECULAR EDUCATION

By J. D. McCORD, OF CHICAGO

THE hope of our nation rests upon the moral and religious education of our youth in the public schools; they are soon to have possession of the entire country, its interests, to control the affairs of church and state, of our schools, of all our public institutions, of our financial interests, indeed, of all the interests affecting our Republic, and it is a matter of great concern as to the preparation which they are now making for such a position. It affects not only their character and destiny, but it affects the character and destiny of our Republic. The best means to promote the moral and religious education of the children in our public schools is to introduce and require in all our public schools daily readings of the Bible, that these boys and girls may hear these truths which are revealed to us in the Book of books.

The Bible is the Word of God—it is God's voice speaking to the world, and in that Word giving us a revelation of Himself and the character and life which is the noblest and worthiest. It should therefore be read by the boys and girls in our public schools, that they may form some true conception of what God is, of His character, of the Spirit that governs Him and His Kingdom, for a nation, a people, a race are what they are largely from their conception of what God is. If they conceive God as a tyrant, as a God of War, as a God of lust, people will live out similar lives. Therefore, the most important thing to correct in the lives of any people is to correct their conception of God.

No heathen people can ever be civilized or Christianized so long as they have their heathenish conception of the Deity. These boys and girls in our schools have their heathenish conceptions of God. They are very far from any Scriptural thought as to His character, as to His virtues, as to the principles which govern Him, and they live careless and indifferent lives of pleasure and sin because they have no thought that God has any concern in such ennoblement of their characters and lives. If we want to transform these boys and girls they must have daily reading of the Word, and form some true estimate as to who God is and the principles which should characterize the lives of those who would please Him. I am sure that this position cannot be repudiated—it is fundamental and as wide as the world.

Another reason for the introduction of the Bible in our public schools is that it affords the best means for religious and moral education. Many of the boys and girls of our public schools have no moral influences brought to bear upon them in their homes, upon the streets or in their daily associations, but the influences which are brought to bear upon them is baneful; they learn profanity, vulgarity, cigaret-smoking, theatre-going (of the baser sort), Sabbath desecration and vices which undermine character, which degrade and ruin them and make them a menace to the political interests of our country. These boys and girls in our public schools have all such evil influences surrounding them and but very little comparatively of the good. Few of their homes are Christian, in few of them do they ever hear the Word of God read or His name spoken with reverence, they have but little regard for the character and the virtues of the Christian; they are not in our Sunday Schools. Half of the children of our Republic never cross the threshold of a Sunday School; they do not attend our church services. They go to base-ball games on Sunday by hundreds and thousands, to the beer resorts and gardens and on Sunday excursions in summer time. If they are ever moulded into ennobling characters, are ever inspired to worthy citizenship and the noblest lives it must be by the influence brought to bear upon them in our public schools. The simple education and interests of our public schools and colleges and higher institutions are not adequate to the moulding of the moral and religious characters of those who resort thither. Now, if they are ever tutored and moulded for the higher patterns of citizenship and character it must be in our public schools.

It is said by Chicago merchants that that which they find in their employes is not the lack of culture, of capability, but it is the lack of trustworthiness. They find only one in 200 who come to them who have characters, moral characters, which are adequate to the tests of business life. The influences of society and of the world are not adequate for the moralizing, Christianizing, or even the civilizing influences of the youth in our public schools. There must be brought to bear upon them the inspiring and helpful influences of portions of the Word of God. In forming habit anywhere else and without it they simply go on under the tutorage of the home, which may be evil, and companionships which are hurtful and motives which are baneful to the detriment of the state, to the undoing of the nation and to their own ruin.

Is there anything harmful to the educational interests of a class or school to sit down and read for opening exercises the Ten Commandments, or the Sermon on the Mount, or the 1st Psalm or the 23rd Psalm, or any chapter in the third Epistle of John? Would the sitting together for ten or fifteen minutes reading these pages be harmful to them in the preparation of their studies for the day? Is it not on the contrary inspiring, stirring up the conscience and putting in their hearts a desire to improve their opportunities faithfully for the uplifting and blessing of their schoolmates? I know that for years in my student life it was our custom to read the Word of God daily, and that in my own experiences these pages and verses as read were very frequently a means of stirring up my own thought to greater fidelity and greater earnestness in the study of the lessons before me, and this is the experience of the schools of our land wherever the Word of God is read daily. It is not in any wise a hindrance to successful studying, but is only an inspiration and incentive to faithful occupancy of time and strength in the studies of the day.

The Bible constitutes the basis of our civilization and is interwoven in the laws of the nation. The laws of christendom are drawn from this Book, and, therefore boys and girls preparing themselves for citizenship in the nation ought to know something of its moral power, of its inspiration, ought to be familiar with those bases of our common law, as well as the enactments into the statutes of our country, ought to be cognizant with the spirit and principles of the moral type of the law of God interwoven in all these laws of the nation.

We have eleven millions of youth in the United States in the public schools. Just think what it means to compel these eleven millions five days of the week to read together some message like the 1st Psalm about eight months in the year. That is a mighty school, and it is an opportunity to impress upon their minds and hearts lessons which will go into all their lives.

Though some of the teachers would read the Bible verses in differently, with light thoughts and in a careless way, yet the Holy Spirit will seal to many of these hearts and thoughts the sacred lessons as they are read from day to day to the betterment and uplifting of many boys and girls. The Holy Spirit can make these lessons effective.

The Bible is incorporated in the history of our nation. Our Pilgrim Fathers, when they came to our shores, built the schoolhouse and the church side by side. The Bible was their daily bread, but it was the foundation of their hopes, it was the ground upon which they reared the structure of our nation. By the truths herein revealed and the principles it gave they stood the mighty shock of the conflicts which they waged against the mother country in rearing this superstructure of our Republic. So the old Puritans and Pilgrim Fathers interwove in their laws, in their customs, in their thought and conversation, in their characters, in their lives, these principles and this spirit, and there were giants in those days. There were men who stood the shock of all the temptation of wealth and power, in the founding of our mighty republic, because they were inspired thereto by the Word of God. Today eight of our states require this reading before their public schools. Thirty-one of them permit the reading of the Bible, and in these thirty-one it is almost a universal custom. Only five have legislated against it. The District of Columbia has its message read. The entire city of New York has the Bible read every day. Washington, Philadelphia and Boston, and a large percentage of the great cities of our nation have these pages of the Word of God read before their children daily as a matter of law and privilege. England requires it as its law, and every school in England is opened by reading from the sacred page. France, Germany, Prussia, Switzerland, Sweden, Norway and Russia read the Bible daily in their public schools. The nations that are controlling the world are the nations that have read the Bible in their public schools.

Even the statesmen and the ruling philosophers of the day realize that in the Bible lies our safety. They ask, what are we

coming to? Our young men are not in our churches, they are not in our Sunday schools. They very soon escape from the public schools into the activities of business or trades, or professions, and go to the bad by the wholesale. The saloons are full, the evil resorts are crowded, gambling is going on. In one gambling resort, a policeman said to me: "There are 500 young men in that place at this hour." The question is, what can we do to stay this tide? In Minneapolis at the National Educational convention they stated that it is essential to introduce into our schools the reading of the Word of God.

We hear it said in Chicago that "we could not do it because there are Jews and Catholics, and others, who would conspire against it." This is certainly not true in regard to the Catholics for the apostolic delegate from Rome to this country said he believed a daily reading was helpful in our schools, and Cardinal Gibbons spoke highly of it. Very many of the Roman brotherhoods have given expression to the same effect. Their Bible is not greatly different from our own, and I believe that the Roman Catholic church would unite in a request for such readings as would be wise and helpful to our boys and girls.

Letters and tracts are being widely circulated in which the Word of God is profaned, the Ten Commandments derided, the Sermon on the Mount defamed; but infidelity and atheism never built an asylum, never sent a missionary to heathen lands, never founded institutions for suffering humanity. They are those who only stand and rebel against these heaven-born influences.

There is no work which is so full of promise as that of the moulding of a child in our public schools, under the influence of his teacher, receiving her constant tokens, her smiles, her love. I do not say that it is her wisdom in explaining the Word of God, but the child recognizes the fact that she believes in a God, that she receives this Word as a revelation from Him, that these motives are inspired. This thought is helpful. It may be the means of uplifting and saving our youth and transforming many of them into the noblest lives.

The rising cloud of sin, intemperance, infidelity, vice and crime is a mighty effort against our republic. The time is at hand when so much is declared against the church of Christ against Christian truth, against even Christian character, principles and virtues, that it will not take many years for these forces to rise and overthrow our Christian Republic and take away from us our Sabbath, free worship and even the Word of God. What other measure is so feasible and so easily to be employed against these evil influences as to introduce the reading of the Holy Bible to the eleven millions of school children in the United States.

MODERN RICE FARMING IN THE SOUTH

A GOVERNMENT expert was recently discussing the modern rice farming of the South as contrasted with rice farming abroad. As the United States is now producing 200,000,000 pounds and has a prospective market at home and in our newly acquired possessions of 725,000,000 pounds the subject becomes one of general interest. Here is what the expert says in regard to the progress made in this industry:

"The spinning jenny and the power loom did not do more to enthrone the cotton industry than the machine seeder, the twine binder and the steam thresher did to make wheat chief of cereals. Rice in all this period of evolution of wheat remained stationary. Fifty years ago it was planted, harvested and milled the world over precisely as it was two thousand years before America was discovered, and to all appearances there would be no improvement for the ensuing twenty centuries. One day some bold optimists conceived the idea that improved farm machinery could be adjusted to the rice industry. After many trials and failures, it was a success. The gang plough, the horse drill and the twine binder and the steam thresher took possession of the rice fields."

"For a thorough inspection of the rice fields of Texas it is necessary to drive into the country from one of the rice shipping stations. In almost every township there are ridges above the surrounding land. Along these have been built canals from 30 to 150 feet in width, according to the area to be watered. The sides of these canals were raised four or five feet by grading machinery. Powerful pumping plants force up the water at the head of the canals from the feeding rivers and lateral ditches convey it to distant farms. Other sections (at least fifty thousand acres) are irrigated from deep wells, the pumps being operated generally by electricity furnished to a number of farms from a central station, and this system is increasing.

"In the first three months of the year the rice fields are ploughed, whether the land is wet or dry. Great gang ploughs, drawn by oxen or mules, hasten the work. Planting is well under way by May 1. It is done with a drilling machine, which puts the rice in at a regular depth, permitting it all to grow and ripen at the same time. It takes one-third of a barrel of seed to the acre, seemingly a small quantity, but no grain stools or shoots more than rice.

"In other fields in May one can see broadcast seeders tramping through the mud. The fields are too muddy for the drilling machines and this makeshift must be used. The sowers are followed by heavy harrows, a process called 'mudding in,' in the vernacular of the planters.

"In June the floodgates are opened and the water pours out of the main canals and lateral ditches. The pumping stations are in operation night and day, some of the larger ones feeding twenty-five thousand acres. The depth of water on the fields varies from one to six inches, according to the rise and fall of the land. A thorough saturation is all that is required; an excessive quantity will neither profit nor harm the plant.

"The rice springs up with surprising rapidity, and it is not long before the drainage gates can be opened and the field cleared. The ground dries out rapidly, and soon the heavy self-binders can be set to work. They are supported by wheels of extra width to prevent cutting into the soft earth. The rice is shocked, as is wheat or oats, and will dry out in ten days, so as to be ready for threshing.

"Rice threshing outfits cost $2,000 on an average, and many of the larger planters own their machines. The average capacity is two thousand bushels a day, and as the average yield is twelve barrels to the acre, one machine can serve a number of small planters.

"The rice belt is well provided with mills, one town, Crowley, La., having seven mills, which cost not less than $300,000. The modern method of milling rice is entirely different from the old.

"A new 10,000 acre rice farm in Harris County, Texas, on the line of the Southern Pacific Railroad, is being equipped with electric pumps, and others will follow as soon as power stations can be erected.

"On the prairie rice lands of Louisiana and Texas one man with a four mule team can plant and harvest one hundred acres of rice. He will require an additional man in harvesting and stacking, and, of course, help for two or three days in threshing. Well tended, his crop will net him one thousand barrels. He may do much better than this, and he may do worse. It costs from $8 to $12 an acre to raise an average crop, which can be sold at a profit of from $20 to $30 an acre. There is a by-product of at least one hundred tons of straw, superior to native prairie hay, and twenty-five tons of bran. On this one hundred head of stock can be wintered comfortably.

"In Japan, one-third of an acre is a reasonable rice farm for a man. In China and India, the water buffalo is used in preparing the land, which enables one man to cultivate one-half an acre to two acres, depending upon the amount of additional help employed. With our improved machinery there is no known country where a dollar will produce as many bushels of rice as in the United States. The indications are that rice production in India and Japan will decrease. Every acre devoted to fibre must be withdrawn from the cultivation of rice or wheat, for every available acre in China, India and Japan is now under cultivation. It should be noted that the increased production of rice in Southern Europe, especially in Italy and Spain, has been considerable within the last thirty years, and wheat, oats and barley have yielded ground."

THE NEWEST IN BICYCLE CHAIRS

A LITTLE vehicle is attracting a great deal of attention in Central Park, New York. Shaped like the chairs one sees on the board walk in Atlantic City, but with the attendant seated in the rear, like a bicyclist, the chair-carriage moves rapidly and can go anywhere that ordinary carriages do.

The carriage is a dainty thing, with its bright wickerwork, the springs and metal work painted a bright green and the man propelling the carriage wearing a neat blue uniform. His sturdy legs are clad in knickerbockers. The attendants are bright-looking young colored men, who were doubtless chosen partly because of the size of their calves.

PNEUMATIC DISPATCH SERVICE OF THE FUTURE

AN IMPENDING REVOLUTION OF TRAFFIC IN ALL IMPORTANT CENTRES OF TRADE

By DR. CURT RUDOLF KREUSCHNER

THE year 1904 is destined to mark an epoch in the development of the system of pneumatic dispatch, which was first introduced in London by Latimer Clarke, just fifty years before that time. The trial route, measuring about 220 yards, served as a model for similar routes in Berlin, Paris, Vienna and other cities. When the first route was completed it proved rather unwieldy, but it has been much improved, and today the pneumatic dispatch service is conceded to be one of the most valuable and effective means of facilitating traffic. Being confined to only a few of the largest cities in each of the countries in which it is used, it has not yet realized the hope that it would eventually become a universal system of packet service.

The new system invented by B. C. Batcheller will be of general interest since he has demonstrated the practicability of the post for delivering parcels. A test line was constructed in Philadelphia some time ago, and the results proved so satisfactory that the Batcheller system, with facilities for a ten-second service, was adopted in New York and Boston. Six pipes, each with a carrying capacity of 600 letters, can be sent every minute. A maximum weight of 315 pounds is transported at the rate of from three-fifths to two and one-half miles per minute, and the postal department, encouraged by the remarkably successful results of the tests, is planning to extend the new pneumatic dispatch system to other densely populated cities—Chicago, St. Louis, Cleveland, Washington and New Orleans.

The tubes are the most important part of the apparatus. They run in parallel lines, only a short distance apart, until they reach the terminating stations, where they overlap, so that the entire line looks like a huge bow, with ends drawn out a long distance. It is necessary to exercise the utmost care in adjusting the pieces of cast iron tubing, so as to prevent the compressed air—the propelling power—from escaping. Coming from the main station, this air circulates incessantly, to return to the central station by way of the auxiliaries. The tubes do not need to be placed in a horizontal position, for they often show curves—the result of adapting themselves to the peculiarities of the locality which they traverse. Their inner surface is as smooth as the inner walls of a barrel in a shot-gun, so that the cylinder-shaped steel pipes that contain the dispatch matter, may encounter the least possible resistance.

The most interesting recent innovations, as compared with the system in its early stages of development, concern the contrivances that make it possible to add new dispatch matter without interrupting the progress of the pneumatic trains that are in motion. This new invention also precludes the possibility of the air escaping when the pipes are suddenly opened, as the compressed air, rushing forth like a hurricane, would interrupt the course of the passing trains. The inventor has constructed an ingeniously contrived apparatus for this purpose. Two pipes are mounted on a movable trestle, so that they can be pushed into the trains alternately. The drums of an ordinary revolver give a good illustration of the principle upon which the transmitter is constructed. In turning around their own axis, five or six short tubes, each containing a cartridge, can be discharged successively in the direction pointed out by the barrel of the weapon. Let us imagine one of these drums, with a segment of cylinder, containing only two tubes and the axis cut out, and let this segment move backwards and forwards, instead of in one direction only, as it does in the revolver. The tubes that are to be forwarded are placed in the pipe which is not being used on the line, but is waiting in the station to do service. Then the contrivance described above is turned, so as to insert the pipe containing the cylinders, in place of the one on the line. The tubes are immediately carried off by the strong current of compressed air. It is evident that special precautions are necessary to prevent the catastrophe that would result if a pneumatic dispatch train, going at full speed, should fly from its course at the moment when the pipes are opened for the exchange of tubes. A branch line is attached where the transmitter joins the main lines. Thus a continuous current of air streams through this auxiliary line, while the transmitter causes an interruption in the main pipes. An automatic apparatus breaks the current of air in the branch line when the transmitter is put back in place. The so-called temporary locks—another automatic contrivance—prevent the rapidly moving trains from coming into too close contact with other trains that move at a slower pace, thus precluding the possibility of a collision.

The receiving apparatus is also constructed in a most interesting manner. A slashed tube, about one and one-half inches long, with a trap door at the end, constitutes the receiver at the terminating stations, where the pressure of air has been considerably diminished, for technical reasons. The arriving tube falls through the trap door and drops noiselessly on a table upholstered with leather. The intermediate stations, where the current of air flows through the pipes in undiminished force, need a more complicated closed receiving apparatus. A movable closed pipe that is lowered 40 degrees whenever a tube enters or leaves it answers this purpose. A simple electrical contrivance directs the tubes to the stations for which they are intended, thereby preventing any errors. No tube that is to travel on ever stops before it reaches its destination, and each tube carries pieces of metal that are placed at stated distances from each other, according to the station at which it is to stop. The receiving stations are furnished with an electrical apparatus for a point of contact, each with a different arrangement for the respective stations. As soon as a tube reaches its destination, this apparatus causes the points of contact that are to form the circuit to unite, thereby causing a continuous electric current, which turns the receiver, built in the form of a large wheel, to 45 degrees. The tube then enters the receiving stations through a sliding valve. The wheel turns 90 degrees for all tubes that are not to stop, and these are sent forward until they reach their station, where they slide into the receiver for which they are intended.

A detailed explanation of all these automatical contrivances would require a thorough knowledge of electro-technical science on the part of the reader. For this reason some information about the practical application of the Batcheller tubular dispatch system would probably be of more general interest. New York is running two such lines, one three-fifths of a mile and the other three and one-half miles. Both are connected with branch lines, and one other connects with the main postal station in Brooklyn. The longest one of these lines, connecting three branch stations and terminating at the H postal station, near the New York Central depot, conveys the bulk of incoming and outgoing mail matter, which averages 12,200 pounds a day. The traffic on this line is incessant, and dispatches are sent from one end to the other in seven minutes, and sometimes in a shorter space of time. The postoffice avails itself of this good opportunity to give the best service possible by using the line for all mail matter that can be sent in this way, thus retarding the closing of stations and distributing mail to the carriers much earlier than before this innovation came into use.

Philadelphia has advanced one step further. The pneumatic system is being used for packet post service there. Trial tests, made with tubes of varying sizes, have proved that the tubes that fit pipes measuring eight inches can convey 60 per cent of all packages delivered in the city, those measuring 10 inches 70 per cent, and the 12-inch pipes 90 per cent. A pipe system, based on this test—with tubes about 36 inches long and 10 inches in diameter—was built to aid in conveying the parcels sent out by large business houses. A precise statistical record of the packages delivered on different days—made by these large establishments—showed where the majority of their customers live.

This solved the question of the practicability of establishing receiving stations in the most frequented parts of the city, where an augmented force of employes attend to the distribution. The advantages gained by this mode of transportation have induced the large firms to build auxiliary lines in their own establishments, so as to avoid the necessity of sending goods to postal stations.

Europe is beginning to realize the great advantages offered to the mercantile world by the pneumatic dispatch service. A company was organized in Paris a short time ago for the purpose of building a dispatch line, and London is already constructing one. A recent notice in a London paper stated that the German postal department had secured the rights to the Batcheller patents, but the report has not been confirmed.

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PUBLISHED ON THE FIFTEENTH OF EACH MONTH AT 112 LASALLE AVE., CHICAGO.
ENTERED AT CHICAGO POSTOFFICE AS SECOND-CLASS MATTER

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OUR DAY
112 LASALLE AVENUE, CHICAGO

Vol. XXII MARCH, 1903 No. 3

Congress Held Up by One Senator.

SENATOR TILLMAN of South Carolina enjoys the unenviable distinction of being one of the first public men elected to high office who has made use of time-worn precedence to defeat the will of the representatives of seventy-five million people, for the special benefit of his own little state. Taking advantage of the Senate rule which provides that the great money bills can contain nothing but appropriations in pursuance of existing laws, unless by unanimous consent of both sides, he set his jaws and would not listen to reason or advice from other senators unless an amendment to pay the state of South Carolina $47,000, for amount expended for the public good during the war of 1812, was included in one of these bills. For hours he held out in his determination during the closing day of congress until, with the defeat of the naval and deficiency bills staring them in the face, involving some $20,000,000 the national House of Representatives and the Senate of the United States yielded to the wish of one man. If the claim of South Carolina was just, and there is much question as to that, it should have been paid three-quarters of a century ago. If it was unjust it should not have been included in the bill by the senate committee, which, however, was dominated entirely by Tillman. The right or the wrong of the thing was not discussed. No evidence was submitted in favor of the item or against it. The senator from South Carolina simply announced in his "slave driver" manner that he would talk out the remaining hours of the session unless the item was restored, and rather than lose two of the most important of the supply bills both houses yielded.

Representative Joseph G. Cannon of Illinois, who is understood to be in line for the appointment of Speaker in the House at the next session, used language which was none too strong in characterizing the action of Senator Tillman as legislative blackmail. In the course of an able address he said: "In the House of Representatives, without criticising either side or any individual member, we have rules, sometimes invoked by our Democratic friends and sometimes by ourselves—each responsible to the people after all is said and done—by which a majority, right or wrong, mistaken or otherwise, can legislate. In another body there are no such rules. In another body legislation is had by unanimous consent. In another body an individual member of that body can rise in his place and talk for one hour, two hours, ten hours, twelve hours. It is a matter of history that a senator on the Republican side in a former Congress talked to death a river and harbor bill. There comes a time constantly in the settling of bills when you must do so and so or so and so, else your bill cannot pass, and this with reference to the great money bills. In my opinion such a condition existed as to this bill, and clustered about this one amendment.

"There was also an amendment put on to the bill in another body which involved legislation to the extent of granting to the State of Vermont $150,000 in adjustment of her war claims. The Senate receded, but your conferes were unable to get the Senate to recede upon this gift from the treasury against the law to the State of South Carolina. By unanimous consent another body legislates, and in the expiring hours of the session we are powerless without that unanimous consent. 'Help me, Cassius, or I sink!' Unanimous consent comes to the center of the dome; unanimous consent comes through Statuary Hall and to the House doors, and comes practically to the House. We can have no legislation without the approval of both legislative bodies, and one body cannot legislate without unanimous consent. There was the alternative—in my opinion, this applied not only to the deficiency bill but to the naval bill, or an agreement as to the naval bill—your conferes had the alternative of submitting to legislative blackmail at the demand, in my opinion, of one individual—I shall not say where—or of letting these great money bills fail.

"I am getting to be a somewhat aged man. I pray God that my life may be spared until an intelligent and a righteous sentiment, North and South, East and West, pervading both of the great parties, will lash anybody into obedience to the right of the majority to rule.

"Gentlemen, I have made my protest. I do it in sorrow and in humiliation, but there it is, and in my opinion another body under these methods must change its method of procedure or our body, backed up by the people, will compel the change, else this body, close to the people, shall become a mere tenderer, a mere bender of the pregnant hinges of the knee to submit to what any one member of another body may demand of this body as a price for legislation."

This Senate rule has become an anachronism which the force of public opinion should sweep aside. It was intended to be a check to unwise legislation, but instead of that it is now being used simply as a club to force through personal schemes of crafty men, who have a shameless disregard for public sentiment and the public welfare. There is reason to believe that every just claim against the government will be settled without resort to such a course as was followed by the Senator from South Carolina.

"ONE DYING IN AGONY—THE OTHER NURSED BACK TO HEALTH."
—*Atlanta Journal.*

Reducing Sunday Trains.

ONE of the significant events of the time as tending to preserve the Sabbath as a day of rest, is the action of one of the leading railways of the country in stopping all Sunday freight trains except those carrying live stock. The railway that has taken the lead in this excellent move is the Chicago & North-Western. On a recent Sunday fully 6,000 of the men employed in the operation of freight trains on the North-Western system spent their day at home, and the general officers of the company did the same. By the latter the innovation of providing a Sunday at home for employes of the operating department proved a great success. The day following the first trial of the new schedule one of the officials of the North-Western declared: "Reports received from all over the system show that the men appreciated the rest, and went to their work Monday in a happy frame of mind

and ready to hustle. We did not experience any inconvenience from reducing freight movements to live stock, perishable shipments and fuel, and found that we were in good shape Monday morning. We do not see why the plan cannot be followed from this on, and believe that it will result in benefit to our men and to the company as well." The officials of other railway systems are watching the new plan with interest and it is expected that they will soon follow the example of the North-Western. Indeed, Vice-President J. N. Faithorn of the Chicago & Alton Railway, said: "It is certainly a move in the right direction and I am in favor of it provided it can be accomplished without inconvenience to patrons during a time like the present. The Alton is not

"YOU ARE MY PRISONER." —*New York Herald.*

ready yet to adopt the measure, but will wait to see how it works out. I trust it will prove a success."

Mr. W. B. Biddle, freight traffic manager of the Santa Fe, said: "I am heartily in favor of curtailing the movement of freight on Sundays as much as possible. It is a question just how far such movement can be curtailed without affecting the grade of the service. I hope the North-Western's experience will show us just how far reform in this direction can go."

The Chief Peril of the Age.

THERE ARE ABUNDANT SIGNS that the "get rich" mania is clutching America more tightly in its grasp with the passing of each succeeding year. It seems to be a fever that burns day and night in the brain of the young man just starting out in life, as well as in the mind of the established man of business. It drives and spurs and tortures its victims to a ceaseless grind of activity toward the goal of wealth and luxury. The poor wretches that are consumed by it are apparently blind to the fact that luxury is an eternal foe to those elements in man's nature which are highest and best. Professor William James of Harvard may well declare that a return to plain and simple living is the greatest moral need of our nation today.

A prominent New York preacher, Dr. A. E. Kittridge, of the Madison Avenue Presbyterian Church, speaking recently to a former congregation in Chicago, emphasized the same truth from a different viewpoint. He said:

"Thousands of our prominent business men who call themselves Christians and go regularly to church are being driven—driven rapidly against the rock of destruction by their tremendous absorption in money making, which is one of the greatest perils of the land today. We see it in the business of daily life. They are diligent in business, fervent in spirit, and think they are serving the Lord, but all the time they are being carried away by this lust of money.

"Take it in social life. Do you not know of multitudes of men and women who have good enough intentions, but because of the luxury in which they live and the society in which they move day after day, their lives are lives of absolute idleness, bent wholly upon self-gratification? They are animated solely by the low, mean motive of self-gratification. To me there is no spectacle more pitiful than that of men or women trusting their souls to God and hoping for salvation while they spend their efforts and time day after day in quest of self-employment. When their lives have been closed they are empty of all real joy.

"Let me tell you, young men and women, if ever there was a time for men and women to act as the children of God and to realize the full possibilities of such life, that moment is nigh. Here, I may say, as in New York, the cry raised is that the great peril of civilization is the constant friction between labor and capital. But there is a question far more thrilling. It is ths tremendous current of passion and of love for money and show which is sweeping God's people away from the passion of the Lord and the teachings of Jesus Christ."

The Novel of the Future.

A GREAT deal of speculation has been aroused as to the novel of the future by the turn in the tide within the past two years. The surprising sales of even inferior stories of the new stamp have led many to declare that the public demand was turning in that direction. The opinion of nearly every author of prominence has been sought, and it is generally found that the majority of them are as much puzzled as their questioners. Anthony Hope Hawkins (Anthony Hope) arrived in New York recently and gave his impressions on this interesting topic. Asked where he thought the new field in novel writing is likely to be, Mr. Hawkins said:

"That is a rather prophetic question, and a reply to it, therefore, could be only surmise. We have it already slightly tapped in Norris' 'Octopus' and 'The Pit,' and also in Merwin-Webster's 'Calumet K,' though, of course, they do not by any means definitely forecast that commerce will be the future field of romance. It may, instead, be the old story retold. Paradox may endure for a day, but for most of us life is a perpetual paradox, and we want to get away from the restlessness of mind that it involves. The migration of the country to the town is being checked, vast numbers of those who can afford to do so are leaving the town for the restful country, and what is true of material conditions is equally true of books. Present-day marvels in electricity and trade are fascinating, but they do not stir the blood like a romance of the olden days. At any rate the novel is undoubtedly one of the chief factors today in reflecting the thoughts of the people, just as the barometer, for instance, tells us of the weather. Each epoch has had its peculiar characteristics. In the expression of contemporaneous thought the arts have each in turn had their say. The middle ages have been represented by architecture, the Renaissance by the painters, the Elizabethan by the drama, and so on.

"In the successful novel the story, well told, comes first, assuredly, among the factors. It is the primitive essential. From that there has been no swerving, no less in the successful novel of

"WE CAN'T HELP BEING SORRY FOR THE NEW UMPIRE."
—*Minneapolis Journal.*

today than in the past. From the point of view of winning enduring popularity the writer must again depend upon his ability to 'spin a good yarn.' The flippant society novel may create temporary interest and have large sales, but after a few months it drops out and is forgotten."

DR. SIMON FLEXNER

FEW of our readers are familiar with the name of Dr. Simon Flexner, and yet this man who is practically unknown outside of the narrow circle of his profession has been chosen by John D. Rockefeller to head the greatest medical establishment of a century, the Rockefeller Institute of Medical Research. He is the one who is to have the direction of $15,000,000 to be spent in medical experiment.

The Rockefeller Institute will stand first among the institutions of its kind in the world. Its home on the East River in the neighborhood of Sixty-fourth Street, New York City, will occupy four city blocks. For the institution Mr. Rockefeller plans to give in all $15,000,000. On the staff of the Institute already engaged in experimental work are some of the most eminent men in the world of medical science.

The whole of the study of the cause and the prevention of disease is to be its field. Its plans are to engage the highest experts in every line of medical science to study and define the causes of disease. It will maintain a great hospital—not primarily to care for the sick—but to house the victims of the various types of disease so that the cases may be studied with a view to discovering what makes the patients ill. Patients are to be admitted primarily for observation, but they will, of course, be treated, too.

In a word, Mr. Rockefeller plans his institution to be the van of medical science and discovery. It is to be the first to apply all the new discoveries in medicine to practical treatment, thus quickly affording a prompt medium for the utilization of every remedy that promises relief of suffering.

Dr. Flexner, the one chosen to head this great institution, is a professor in the University of Pennsylvania, hardly known to half the students, and yet ranked among the first of medical men in the world.

Unmarried, without any interest outside of his own beloved science, Dr. Flexner slept in the dormitories with the college boys and spent his days in his laboratory until a short time ago. Recently he went to board at the home of Professor Clarke of the chair of gynecology, at 215 South Fifteenth Street, Philadelphia.

Dr. Flexner is a Johns Hopkins man, a Southerner and a Jew, born in Louisville, Ky. His life has been spent in the quiet of study, and for that reason he has become little known to the public. It has been the ambition of Dr. Flexner to find an antitoxin for a rattlesnake bite. One whole room adjoining his laboratory is filled with the most venomous of these reptiles. Other notable experiments of Dr. Flexner's have been in yellow fever and the bubonic plague. His work in the latter probably won him the greatest fame. When the Government wanted the three most expert pathologists in the country to go to the Pacific coast to study the possibilities of the introduction of the bubonic plague into the United States, he was chosen as one of the three. In the Philippines he discovered the germ of dysentery, the disease which had so troubled the army in that tropic climate. He was sent there especially to make a study of this complaint.

Dr. Flexner's selection as the head of the new Institute is regarded as the most natural by the knowing ones in the pathological field. He is considered by many to stand first in that line.

He has held his post at the University of Pennsylvania since 1899. He was brought from Johns Hopkins. His loss was keenly felt by the latter institution, which replaced him with another eminent man, Dr. W. H. Welch, also on the board of the Rockefeller Institute. Dr. Flexner's writings include: "Micro-organisms," "The Nature of Snake Venom," and many papers on bacteriological and pathological subjects.

An understanding has been reached by which the Carnegie Institute of Science and the Rockefeller Institute are to work in perfect harmony. The former, which has an endowment of $10,000,000, is to confine its activities to scientific research, while the Rockefeller Institute will devote itself to medical research. In this connection it may be mentioned that Dr. Flexner recently received a $2,000 prize for his discoveries in snake poison.

HAS WON NATIONAL FAME

JOSEPH W. FOLK, the circuit attorney of St. Louis, has acquired national fame within the past two years, as the man who has purified the political atmosphere of that great and corrupt municipality. He has sent fourteen men, including the democratic leader, a millionaire or two, and city law makers, to the penitentiary for the crimes of bribery and perjury, and he hopes to convict ten more men on similar charges. In addition to this he has caused four others, one a multi-millionaire, to become exiles from American soil.

In less than three years this country lawyer cleaned St. Louis of the municipal debauchery that had infected it for twenty. Alone and unaided he has performed this monumental task by bluff, hard work and his knowledge of criminal law gained while defending petty offenders before the courts in his home town of some 3,000 population.

When, in his twenty-third year, Mr. Folk set himself up in St. Louis, it was with the determination to begin all over again. He decided to drop criminal law, which he had been practicing ever since his graduation from Vanderbilt University three years before, and to take up the civil end of the profession. Gradually he succeeded in getting business men to trust their legal interests to him, and so firm had his purpose become never to meddle in things criminal again and so remunerative was his civil list, that when, unexpectedly, "Boss" Edward Butler (dem.) appeared before him and asked him to become the party's nominee for circuit attorney, Mr. Folk instantly refused to consider such a proposition. It was only when Mr. Folk's clients put in their appearance and asked him to accept that he finally consented.

The year 1901 found a civil lawyer occupying the position of circuit attorney of St. Louis, and his name was Joseph W. Folk. Naturally, Mr. Folk fell immediately back on his knowledge of criminal law gained in his home town, and he worked at night to improve this.

He was thus occupied, when, one day, he saw a "squib" in a newspaper stating that it was rumored that certain members of the house of delegates (St. Louis' lower legislative branch) were having some trouble in getting at $75,000 bribe money in a safe deposit vault, which they felt they were entitled to have.

A few days' inquiry satisfied Mr. Folk that the clipping referred to an attempt on the part of the Suburban railway to secure the passage of an ordinance enhancing the value of its property several millions. Then, although he had absolutely nothing except his suspicions that this was so to back him, he sent for the railway's millionaire president, Charles H. Turner, and its legislative agent, Philip Stocke, to appear before him. When they came he informed them that he wanted them to tell him about the attempt which they had made to bribe the house of delegates to pass house bill No. 44. They denied that any such thing had been attempted.

"Very well, gentlemen," said Mr. Folk, "it will be my duty to issue warrants for your arrest and prosecute you to the fullest extent of the law. Would you rather have me do that, or will you come back to me at the end of three days and give me the information demanded?"

At the end of the second day ex-Governor of Missouri, Charles P. Johnson, one of the leading criminal lawyers of the middle west, walked into the prosecutor's office.

"Mr. Stocke is my client," he said. "I have come to tell you that he is so ill that he cannot appear before the grand jury tomorrow."

"Governor," was Mr. Folk's reply, "I'm sorry that Mr. Stocke is ill, but appear he must before me tomorrow and tell me what I demand of him, or I shall see to it that he is arrested and prosecuted to the fullest extent of the law."

The quiet, determined manner of the young man and the set of his prominent jaws made the older report to his client that "Folk means business, and you'd better do as he says." The result was that next day not only Stocke, but his millionaire employer, Turner, walked into the grand jury room and told of the boodle clique in the house of delegates and city council, and of the railway's attempt to put through house bill No. 44 with the aid of $135,000 in bribes, $75,000 for the delegates and $60,000 for the councilmen.

The rest is already known. This is the biggest collapse of a corrupt political ring since Tweed was sent to jail and has placed Mr. Folk in the foremost rank of the leading criminal lawyers of the day.

INJUNCTION TO PREVENT STRIKE

THE first injunction granted by a court to a corporation to prevent a strike on the part of railway trainmen and firemen was issued by Judge Adams of St. Louis to Joseph Ramsey, Jr., president of the Wabash Railroad. It is a most notable and dangerous precedent, since, if this injunction is sustained by the higher courts, it can be used to fetter labor and create endless discontent. Furthermore, if labor should be successful in gaining control of any particular court, capital could likewise be forced to grant its terms through the same method. The injunction reads as follows:

"Whereas, It has been represented to the judges of the Circuit Court of the United States for the Eighth Circuit in the Eastern District of Missouri, in chancery sitting, on the part of the Wabash Railroad Company by its certain complaint against you and each of you, that you are combining and confederating together to order and cause a strike on the part of the employes of the said railroad company, engaged in and about the operation of its trains, as brakemen, switchmen, and firemen, and in interfering with, hindering, obstructing and stopping the business of said railroad company as a common carrier in the United States.

"We, therefore, in consideration thereof and the particular matters in said bill set forth, do strictly command you and each and every one of you, individually and as representatives of the Order of Brotherhood of Railway Trainmen and Brotherhood of Locomotive Firemen, you, and said organizations, representatives, clerks, agents, and attorneys and all others who may be aiding and abetting you or them, or acting in concert with you or them, and under your or their direction, until the further order of this court, absolutely to desist and refrain from in any way or manner ordering, coercing, persuading, inducing, or otherwise causing, directly or indirectly, the employes of the said Wabash Railroad Company, engaged in or about the operation of its trains within the United States, and brakemen, switchmen, or locomotive firemen to strike or quit the service of said company; and from in any way molesting or interfering with said railroad company's said employes, or with the operation of its trains, or the conduct of its business as a common carrier."

Concerning this injunction, Wells M. Blodgett, vice-president and general counsellor of the Wabash Railroad, says:

"The court proceedings are based on the provision of the Interstate Commerce law. That act makes it the duty of the railroad companies to receive and transport all kinds of interstate traffic, and requires them to interchange such traffic with each other at connecting points, and any conspiracy on the part of any number of persons to defeat the act, or the provisions of any federal act, is wrong, and renders the parties liable, criminally and civilly. This is not a mere theory; it is the settled law, and the injunction only goes to that extent. Should the order be violated, it will be for the court to say what steps it will take to enforce the order, but we have no reason to believe that anyone intends to violate it."

President Ramsey, who is responsible for the injunction, is practically at the head of the entire system of Gould railroads, though his official title is president and general manager of the Wabash. While Mr. Ramsey is not pugnacious, he is known to be a man of great firmness. He is really the confidential man of George Gould and the millionaire railroad owner will give Mr. Ramsey all the backing in the fight he wants.

Mr. Ramsey comes from a family of railroad men. By profession he is a civil engineer and was early trained in railroad work. After holding several positions with different lines he was made assistant to President Ingalls, of the Big Four, and later was made general manager of that company with headquarters at Indianapolis.

He resigned from the Big Four to become president and general manager of the St. Louis Terminal Association, and there he made such a splendid record that the attention of George Gould was attracted to him. Mr. Ramsey was made vice-president and general manager of the Wabash. A couple of years ago he was promoted to president and his word is absolutely law on that road, not even the directors interfering with his work. He is forty-six years old.

A RAILROAD MAKING MACHINE

WHAT is said to be the only complete machine for laying railroad ties and rails is now employed by the C. R. & M. and lying on the Ohio-Indiana State line at Peoria. This machine furnishes its own motive power and hauls steel and ties for a two-mile run, the while laying ties and track at the rate of over a thousand feet an hour.

When a day's work grading is ready for it, a locomotive backs a train of material down and it is coupled on to the track-laying machine. This train consists of seventeen cars of ties and nine cars of steel, the necessary fish-plates and bolts being distributed along each car. The ties have been specially loaded, the two bottom layers being laid lengthwise of the cars, so as to leave a gangway on either side just track wide for the steel.

In the carlike structure between the engine house and the horizontal derrick, is a drum on which two strong manilla lines are wound. These ropes are unwound and carried back to the steel cars. Here a pair of rails are attached to the two ropes which draw them toward the machine. As they pass, the workmen on the cars bolt rail after rail until the first rail reaches the machine, when the ropes are unhooked, and the rails furnish their own connection with the rear. As the rails were drawing forward to the machine, friction rollers placed every few feet along the sides of the cars enabled them to move without friction. The boilerhouse and water-tank are set up above the car on which they are carried, and the rails pass directly through.

When the rails enter the machine they are engaged by two powerful friction rollers. As the rails pass the forward end of the tie cars, workmen lay the ties on the rails at the distance apart they are to be laid on the grade.

The ties are thus carried to the machine where a toothed elevator lifts them from the rails, carries them up through the door raised up in the roof of the machine, and out over the long derrick, from the end of which they swing down to the grade far enough in advance of the steel to enable the expert crew of grade men to space and tamp them.

In the meantime the steel has been progressing. The moment a rail is disengaged from its friction clutch a workman inside unbolts one end of the fish-plate, and smaller friction rolls, which have already engaged the rail, continue its progress through the machine and out underneath the derrick. Here it is engaged by swing tongs, which lower it to the ground. In all good railroad building the joints in the two tracks alternate; that is, the ends of two rails on one side are opposite the middle of the rail across from it. The man inside the machine thus turns from right to left, having always half a rail advantage in unbolting the continuous string from the rear, and the derrick or crane man has the same advantage in lowering the steel. As the steel touches the ties, the track foreman directs the alignment, while one man rebolts the fish-plate to the track and the spikers fasten it to the ties.

While this is taking place the machine is moving forward exactly in unison with the progress of the work.

The machine was built at Scranton, Pa., seven years ago, and has been in constant use ever since, and has the record of never having killed nor injured a man. Its inventor built the one machine and appears to be one of those rare characters who are satisfied with a competency, for he has built no others. The last road which this machine built before coming to the C. R. & M. was the Carnegie line, in Pennsylvania, a private line connecting steel trust mills.

The crew consists of four men—foreman, engineer and the two who disconnect and lower the rails. In addition, the employing company furnishes forty track hands.

The sand-blast as a substitute for soap, water, and scrubbing brush is a novel idea, but this has been used recently in the renovation of the Government Printing Office and the Treasury Building at Washington. A Chicago company has had a portable plant built for the purpose and engages in the business of cleaning the fronts of marble buildings in all parts of the country.

Religion and Reform

FREEDOM OF WORSHIP TO RUSSIANS

RUSSIANS will long have reason to remember March 12 as a red-letter day in their history. On this day the czar issued a decree granting freedom of worship to all of his subjects who profess nonorthodox creeds and extending a system of local self-government to villages and communes.

The czar's edict is only a preliminary announcement of a series of reforms in contemplation. These reforms are pledged, but their details apparently are not yet decided upon. In brief, they contemplate the following:

1. Freedom of worship to all creeds.
2. Release of peasants from burdens of enforced labor.
3. Revision of the laws governing rural communities.
4. Inviolability of communal property to be maintained.
5. Reform in provincial governments and district administrations.

There are in European Russia at the present time 107,676 communes, each nominally ruled by an elder, elected by the peasants. These communals have only the crudest form of self-government. The czar's decree issued a few days ago indicates that the communes are to be given more power.

The decree is the most significant and far reaching exercise of royal power since the emancipation of the serfs by Alexander II. in 1863. The public hails it as the proclamation of a new era for the Russian people.

Although the Jewish faith is not specifically mentioned in the czar's decree, it is believed that the liberty granted to "all creeds" is intended to include the Jews.

Among the measures outlined by the czar is reform of the rural laws, which is to be effected with the advice of persons who possess the confidence of the people. The system of administration in the various governments and districts is to be examined by representatives of the different localities concerned, with the view of effecting the necessary amendments.

Measures are also to be taken to relieve the peasantry of the burdens of forced labor.

SERVICE IN THE DARK A SUCCESS

THE service in the dark planned by the Rev. C. J. Parker, of the parish church of Clerkenwell, London, has been tried with evident success. It will be remembered that the chief reason given by Rev. Mr. Parker for this innovation was his desire to hide the poor clothes which his parishioners were obliged by circumstances to wear. On the first evening of the new service the church doors were opened soon after eight, and it quickly became evident that the congregation would be a large one. Many had come who seldom entered a place of worship, and, while women prevailed numerically, there was a satisfactory proportion of men, of whom several were in their working attire. Just sufficient light was provided to allow the congregation to reach their seats, and this was turned out entirely as the stringed orchestra took their places. The opening hymn was "Jesus, Lover of My Soul," the slide being an enlargement of the page, with the tune, and it was thrown upon a sheet above the chancel screen. The prayers in due sequence were similiarly shown, with the reciting note, and looked like colossal pages from a book set in exceptionally clear type. The Psalms were omitted, and there was only one lesson, this being the parable of the Prodigal Son, which was illustrated by six or eight colored slides. These were exhibited a second time, when the rector gave a simple address on this ever-enthralling story. The service was reverently and attentively followed, and the confession and creed were recited with unwonted fulness of sound, while the hymns were heartily sung. The service will be repeated every Thursday at half-past eight, and no collection is taken, the only request that was made during the evening being that the congregation should make the meetings known as widely as possible.

MORAL LEGISLATION OF LAST CONGRESS

THE most notable temperance legislation of the Fifty-seventh Congress was the Gillette-Lodge Act, forbidding American rumsellers to sell intoxicants and opium in Pacific islands having no civilized government, which had been promoted daily for twenty-one months by the International Reform Bureau, to whose superintendent, Dr. Wilbur F. Crafts, President Roosevelt gave the pen with which it was signed. The same organization originated and promoted the victorious Bowersock amendment, forbidding the sale of intoxicants in United States immigrant stations.

The amendment prohibiting the selling of intoxicants in the Capitol building was introduced by Hon. Charles B. Landis, with no outside prompting. Senator Bate saved it from being dropped in the Senate. The Anti-Saloon League, through Senator Hansbrough, secured a second half-million dollars for amusement rooms and gymnasiums to be used as substitutes for the suppressed "canteens," whose attempted revival was successfully opposed. The W. C. T. U. secured a renewal of the act shutting out tobacco packages and pictures and cards promotive of gambling and impurity through the persistent aid of Congressman Steele, and these same earnest white ribboners won a signal victory in the administrative field in securing the appointment of six women inspectors of immigration, with a view of breaking up the systematic importation of girls for immoral purposes.

The greatest moral measures before Congress, for which the people petitioned most earnestly, failed, namely, the anti-polygamy amendment, which died in the House Judiciary Committee; Hon. John J. Jenkins, Chairman; and the interstate liquor act to protect prohibition states and no-license towns, which passed the House with commendable promptness, aided by Hepburn, W. I. Smith, Lot Thomas, all of Iowa, Littlefield of Maine, and Clayton of Alabama, but died in the Interstate Commerce Committee of the Senate, Hon. S. B. Elkins, Chairman.

The record, as a whole, falls far short of the preceding Congress, during which nineteen acts of government in behalf of good morals, including executive acts, were secured.

The reform measures that died with the expired Congress will be taken up anew at once. Among these left-over measures to be renewed are the interstate liquor bill, the McCumber bill to forbid liquor-selling in government buildings, the anti-polygamy amendment, and the Jones bill, embodying amendments to the anti-lottery law drawn by the Postoffice Department to exclude the turf investment companies, gift enterprises and guessing contests that have so heavily defrauded the people of late from the use of the United States mails. Those who are eager to forward these reform measures can do so effectively by approaching their representatives and urging them upon their attention while they are at their homes.

VALUE OF JUVENILE COURTS

JUDGE LINDSAY, of Denver, Col., has calculated the saving to the state made by the Juvenile Court laws, and the results obtained are as follows: "It costs on an average $227.92 for each boy dealt with in the criminal court under the old system.

"The total court costs, including fees of every character, paid by the county under the juvenile court are on an average of $11.89 for each boy, a saving of $216.03 on each child.

"More than the saving of dollars and cents is the inestimable advantage to the state, as well as to the individual, in the wholesome and beneficial effects upon the child and its future career by the different methods of treatment, which is impossible in any ordinary criminal court without a probation system."

Those states which have not yet adopted the Juvenile Court system could profitably investigate results further.

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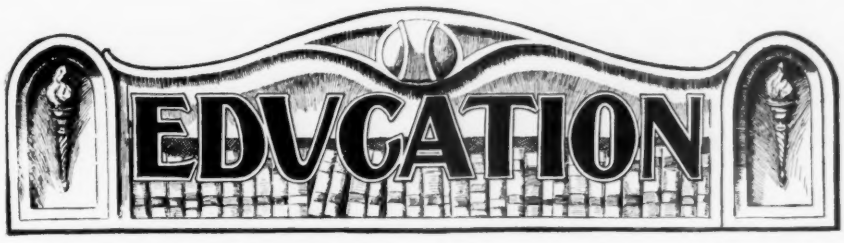


PHYSICAL TRAINING IN PUBLIC SCHOOLS

DR. LUTHER H. GULICK, the newly appointed director of physical training in the public schools of Brooklyn, has just delivered an able address before his associate instructors in which he took occasion to consider some of the difficulties which face the city pupils. He characterized the city as a biological furnace and remarked that "the type of personality which will ultimately be developed by the city will be largely more complex, more powerful and more healthy than any personality which has been produced in the world so far." In his opinion it was the function of the physical directors and instructors to help mankind to stand permanently the strain of city life by developing in the individual to the maximum the power of life. He said:

"We who are concerned with the maintenance of health must face present conditions in a way that they have not been faced since the readjustment of city and country life. It is now our problem as biological engineers to show what needs to be done and to carry it out, that our children shall, under the conditions of city life, not only maintain the average health of the past, but become stronger and finer children than the world has ever seen before, children who as men and women will be adequate to the superb opportunities of the city of the future. Our first proposition is that children of the city are without much necessary muscular exertion and without opportunity or incentive toward much voluntary muscular exercise through adequate plays and games. The first necessity, then, for us as physical trainers is to provide for the development and fashioning of plays and games that shall engage large numbers of children, which shall be as interesting as the traditional plays and games of the past have been, which are as adequate for the development of the body as the old games were, and which shall be feasible under the conditions of city life.

"Children sit at the school desk approximately five hours per day. Sitting, and particularly writing and reading, are biologically abnormal and tend to the induction of positions of the body which restrict circulation, respiration and assimilation, the three fundamental biological processes. The school desk seems to be necessary. It must be met with frequent breaks throughout the school day, when the individual will rise, will vigorously exercise the muscles which counteract the desk attitude and which will at the same time increase the circulation and respiration.

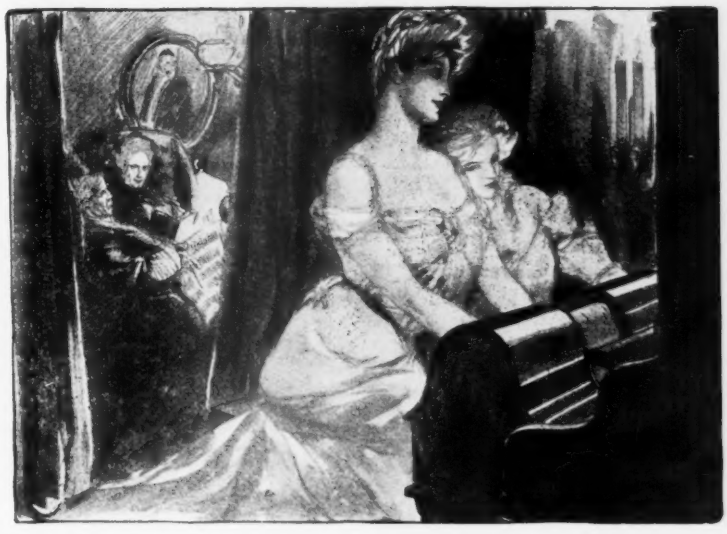
"In order to develop conscious control of the body through the maintenance of good position of the trunk, there must needs be a brief time during the school day given to those forms of formal gymnastics which are distinctively educational in their character, which shall progress from year to year in their educational demands, which shall secure that prompt response of body to mind, that immediate control of all parts of the body as well as that organic vigor which we have seen to be connected with such gymnastics.

"There are no average children. Children, like adults, are all individual, and excel or are weak in specific qualities. But within certain well-defined lines children between certain ages work together readily. But there are always individuals who depart so far from the normal and ordinary rate of progress that it is prejudicial to them and also to others from whom they differ. Some with exceptional speed and power can outstrip their fellows in keeping step. Others, because of congenital peculiarity, or because of the tragic condition of their early lives, are deficient. These need segregation and that emphasis upon physical health and physical education which Seguin, Wey and others have so amply demonstrated to be a primary condition to the most wholesome development of these individuals. To co-operate in the segregation and training of these individuals that they may, so far as possible, ultimately come into conditions for self-support must be a definite and important part of the work of this department."

The registrar of Columbia University has compiled statistics relative to the larger universities of the United States, which show the enrollment of students thus:

Harvard	5468	Yale	2804
Columbia	5352	Pennsylvania	2549
Chicago	4296	Nebraska	2289
Michigan	3764	Syracuse	2029
California	3676	Indiana	1648
Minnesota	3505	Missouri	1408
Cornell	3281	Leland Stanford	1378
Wisconsin	2884	Princeton	1345
Northwestern	2875		

Two Practical Questions



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NEW YORK'S SCHOOLS FOR CRIPPLED CHILDREN

IN New York City there are seven day schools for crippled and deformed children, as well as the school connected with the Hospital for Ruptured and Crippled. In point of fact, the educational privileges of these helpless children of New York City are greater than in any other large city.

The largest of these schools, and one of the most interesting, is in the Industrial School of the Children's Aid Society at 350 East Eighty-eighth Street. One hundred and twenty-six crippled and deformed children are in attendance, and there are two large wagonettes, which were specially designed for the purpose, to take them to school in the morning and return them to their homes in the afternoon, and this expense, together with the cost of the dinners which are provided the children in school, and all the pleasures and comforts afforded these little ones, as well as the cost of supplying a trained nurse and appliances, were borne by the late Mrs. Walker and her sister.

As stated by their teacher, Miss Stackpole, "To educate these children in the best manner which will aid them in the future is a problem which all who are interested in these little unfortunates are endeavoring to solve. During the past year some of our older girls were taught to cut and make their own dresses, make little worsted hoods for baby brother or sister, and other articles needed in the home. We hope to enlarge this work during the coming year, particularly in the dressmaking department. If these girls could make not only their own clothes, but those of their younger brothers and sisters, they would be doing a good share in aiding their families until they became competent to fill some position that would in time make them self-supporting. Our class has now been in existence for two years, and it is very gratifying to note the progress made mentally and physically by these little sufferers. Many who upon entering the class were considered mentally incapable of being taught have developed wonderfully under the teacher's patient guidance; thus showing that such children's minds were simply dormant and required but encouragement and a little kindness to arouse them. Even in the case of children who are mentally deficient we have found great improvement, especially morally."

THE CARNEGIE INSTITUTION

THE New York Independent calls attention to the fact that the $10,000,000 donated to found the Carnegie Institution in Washington is not such an enormous amount as might appear at first sight and that it can hardly be expected to work a great revolution in the study of science in this country. It shows that even if its income should amount to $350,000, or even $500,000, that sum would be greatly exceeded by the annual appropriations for research and education already provided by our Government. Mr. H. W. Wiley, of the Department of Agriculture, has lately summed up these appropriations for the last year as follows: To the Bureau of Standards, $71,060; Coast and Geodetic Survey, $828,525; Geological Survey, $1,066,570; Agricultural Experiment Stations, $720,000; Agricultural Department, $4,488,960; Agricultural Colleges, $1,908,010; from the Federal Treasury, and enough more from the States, through former grants to them and other sources, to bring the total income of the agricultural colleges to the sum of $7,386,241. The Agricultural Experiment Stations received also from other sources an additional sum to bring their income up to $1,231,881. The total sum aggregates $15,055,238, of which fully one-third is devoted wholly to scientific purposes, a sum ten times as great as the largest probable income of the Carnegie fund. It is clear that the Carnegie Institution cannot pretend to compete in scientific research with existing institutions. Harvard University alone has an income four or five times as great as that of the Carnegie Institution. Nevertheless, by a wise expenditure the Carnegie can wonderfully stimulate investigation along lines not otherwise provided for. The trustees cannot do better than to follow quite exactly the suggestion of Mr. Carnegie, who specified as one of the main objects of his foundation, "to discover the exceptional man in every department of study, whenever and wherever found, inside or outside of schools, and enable him to make the work for which he seems specially designed his life work."

Medical Problems of Our Day

TYPHOID FEVER AND FILTRATION

THE problem of securing an abundant supply of pure water is a question which confronts every city. The Public Ledger, discussing the needs of Philadelphia, gives an interesting summary of information on "Typhoid Fever and Filtration." In emphasizing the necessity of some aggressive measures it states that "the deaths from typhoid fever in Philadelphia in recent years have been in the ratio of one to about 7,500 of the population, but in 1899 this ratio rose to one in 3,500, and the figures for 1902 will show that it is again high," and continues:

"New York, Boston and Brooklyn all draw their water from reservoirs constructed in distant watersheds, and the mortality from typhoid in those cities is fairly even. The ratio in New York, in the past ten years, has fallen sometimes below, but has not risen above, one in 8,000. In Brooklyn it is a little higher; in Boston about the same. It may be noted that New York reported but thirty-four cases of typhoid fever in the last week in January, against 325 in Philadelphia. Chicago, in 1890, lost one inhabitant in every 450 from typhoid fever, and in 1891 one in 1,000. Then the intake of the water works was moved far out into the lake, remote from the pollution of the city, and the mortality dropped to about the same rate as in New York.

"These are results obtained from what may be called a natural water supply, approximately pure. It was about the same time that the German cities began those demonstrations of artificial purification, by an imitation of natural methods, that have altered the whole conditions of the problem. In considering the statistics of deaths we must not overlook other sanitary improvements, as in modern systems of sewerage, plumbing, and so forth, but the agency of the water supply is sufficiently apparent. In the ten years preceding 1853, when the old water works were installed, one person in every 900 inhabitants of Berlin died of typhoid fever. Gradually this was reduced to one in 9,000. In 1893 new water works were completed, supplying the whole population with filtered water, and the mortality from typhoid was reduced to one in 50,000. We obtain these figures from some instructive charts prepared from official data by Dr. Seibert, of New York and lately published in the New York Medical Journal.

"The experience of Hamburg is equally striking. The filtration system was introduced there after the frightful cholera epidemic of 1892. The deaths from typhoid that year were one in 7,200; the filters began their work in 1893, and the next year the typhoid rate dropped to one in 10,000, and so on down to one in 60,000 in 1900. Other German cities have a similar record, their typhoid death rate in the past ten years averaging about one in 50,000—a rate so low as to be almost negligible.

"This is the result we are aiming at and expecting in Philadelphia. It is slow work, and the single filter bed already in operation makes too small a contribution to the whole supply to have any effect upon the vital statistics. With experience elsewhere to guide and suggest, there is every reason to anticipate results of the highest value, far exceeding what would probably have been accomplished by a distant supply, since all streams and lakes in inhabited sections of the country must be increasingly liable to infection, whereas the abundant flow of the Delaware can be effectively cleansed near at hand and so distributed."

SANITARY HOMES FOR THE POOR

SOMETHING is needed in American cities to compare with the vigorous methods now in force in Great Britain for re-housing the poor, pulling down the unsanitary houses and erecting healthful homes within the reach of the poor. The town clerk of Liverpool stated not long ago that at the time when vigorous steps for the re-housing of the poor in that city were taken by the Corporation the number of unsanitary houses was 22,000. That number has been reduced by demolitions and alterations to 10,000.

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THE ART OF THE CHEMIST

THOSE who are accustomed to smell their fragrant perfumes and dream that the essence is extracted from gardens of roses and forest glades little think that the cunning hand of the chemist has been at work. It is he that has transformed evil odors into that which now delights the senses. F. A. McKenzie, in the Daily Mail, writes thus of a factory in the slums of London: "Here in the chemist's hands rancid butter, distilled with alcohol and sulphuric acid, is transformed into the essence of pineapple. He takes putrid cheese and sugar and brings forth a preparation that recalls memories of Pacific islands in flower time. Evil-smelling chlorine under his treatment becomes an agent for the production of the essence of the lilac, or geranium, or lily of the valley. Strong vinegar and alcohol yield the delicate flavor of the pear. Coal tar enters the laboratory, and after being subjected to treatment becomes the most delicate of flavorings or the most dainty of scents.

"There was a time when men went for their dyes, flavorings, and scents to nature. Indigo, for example, was made from the indigo plant. Today it is made without it by the chemist at a fraction of the cost, and many of the old indigo plantations now lie waste. Lily of the valley and other scents were extracted from flowers; this is no longer necessary. The chemist will tell you that the artificial product is better, since in the extraction of perfume from the flower valuable properties are left behind or destroyed, and even some undesirable ones remain. The artificial product, properly made contains the properties of the perfume in the proportions in which they originally existed in the flower.

"Science has stepped in to supply the shortcomings of nature. Faraday and Woehler, nearly eighty years ago found out how multitudes of new and interesting substances could be created, and artificially made. While chemists failed to learn how to make artificial diamonds profitably—the dream of so many—they succeeded in giving us aniline dyes, which have given greater profit than ever diamonds could.

"The great value of this successful experiment in the British manufacture of the essential material of perfumes lies in the possibilities it presents. Perfumes are only one branch of the synthetical chemical trade we have lost. If we can win one back we can win others back. The lack of training is being gradually remedied. London University is awake on the matter, and the establishment of the new Birmingham University is a decided step in the right direction. The London County Council has also recently made technical education a subject of special investigation."

PRESERVE RUINS OF CLIFF DWELLERS

DR. HENRY M. BAUM, President of the Records of the Past Society of Washington, D. C., has returned from a two months' visit to the ruins of the cliff-dwellers in Colorado, New Mexico, and Arizona, and will recommend that three groups of ruins—the Mesa Verda, near Mancos, Colorado; the Chaco canon, in New Mexico; and the Canon de Chelly, in the central part of Arizona—be set aside by Congress as national reserves. He is opposed to the project which is being agitated to set aside 480,000 acres which constitute Jaurito Park, near Espanola in New Mexico. He will also urge Congress to order an archaeological survey of the Southwest. He will return to Colorado next summer, and will head an expedition which will go over the territory just covered in a more comprehensive and detailed manner. He asserts that the cliff dwellers lived at least 1,000 years ago, and, possibly, half a century earlier, while evidences exist of the habitations of many millions of people. In speaking of his trip, Dr. Baum said:

"During my trip I do not think that I averaged ten miles in any one of the cliff-dwelling districts where I did not come across some of the habitations in which these prehistoric people lived. I saw on my entire trip enough dwellings to accommodate 2,000,000 people. From what I saw I believe the country must have been inhabited by at least 7,000,000 persons. I am firmly convinced of one fact and that is that the cliff-dwellers were all of a contemporaneous civilization which dates back before the heavy lava overflow in the Southwest. The pottery, stone implements and skulls found in these three classes of ruins are all the same. It is quite evident that the vast civilization of the entire country was extinguished by a flow of lava, an eruption similar to that which recently occurred at Martinique. Those who were not killed directly by the lava flow succumbed to the pestilence which followed. There were numerous evidences of the lava flow throughout the entire region. In one instance I saw a vast irrigation ditch filled with lava and in New Mexico there were numerous dwellings covered with it."

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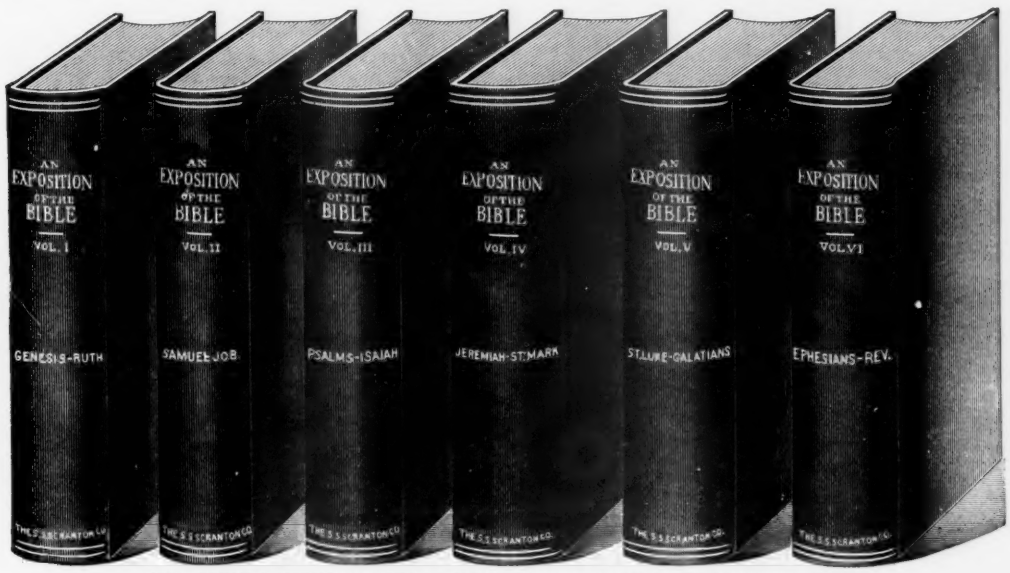

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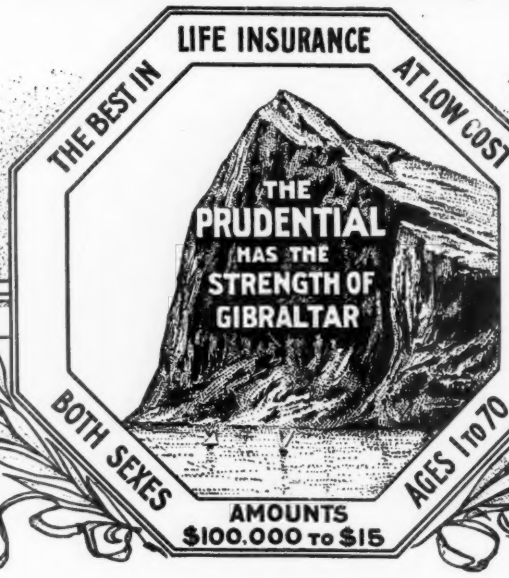

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